# (19) World Intellectual Property Organization International Bureau



### | CHAR CHILDRAN CHIL

(43) International Publication Date 11 November 2004 (11.11.2004)

PCT -

# (10) International Publication Number WO 2004/097505 A3

(51) International Patent Classification<sup>7</sup>: G02F 1/13

(21) International Application Number:

PCT/US2004/012583

(22) International Filing Date: 23 April 2004 (23.04.2004)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data: 60/465.196

24 April 2003 (24.04.2003) US

(71) Applicant (for all designated States except US): AL-PHAMICRON, INC. [US/US]; 277 Martinel Drive, Kent, OH 44240 (US).

(72) Inventors; and

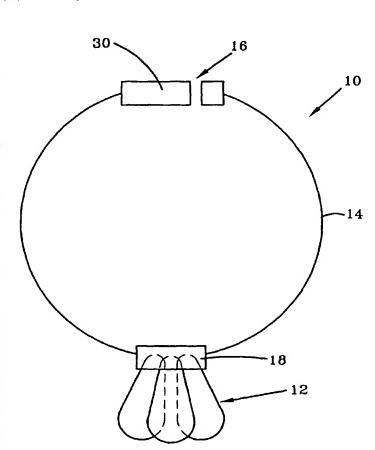
(75) Inventors/Applicants (for US only): MILLER, Roy [US/US]; 3333 Parnell Drive, Akron, OH 44319 (US).

HUPPER, Joshua [US/US]; 703 South Lincoln Street, Kent, OH 44240 (US). TAHERI, Bahman [US/US]; 2030 Garden Lane, Hudson, OH 44236 (US). KOSA, Tamas [US/US]; 1480 Stratford Drive, Kent, OH 44240 (US).

- (74) Agents: MORTON, Andrew et al.; 106 S. Main Street, First National Tower, 4th Floor, Akron, OH 44308 (US).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH,

[Continued on next page]

(54) Title: LIQUID CRYSTAL ACCESSORIES



(57) Abstract: An accessory article incorporating liquid crystal materials includes at least one liquid crystal cell and at least one formable member for carrying the liquid crystal cell. The article includes a driving circuit connected to the at least one liquid crystal cell to control the appearance thereof The liquid crystal cell comprises a pair of opposed substrates, wherein each the substrate has an electrode disposed thereon and facing the other the substrate with a gap that receives the liquid crystal material. Application of an electric field by the driving circuit allows the liquid crystal cell to reflect a desired color and in a desired logo or shape.

#### 

GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

#### Published:

with international search report

- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- (88) Date of publication of the international search report: 14 April 2005

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

#### INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/12583

IPC(7)	SIFICATION OF SUBJECT MATTER : G02F 1/13 : 349/13,77,138						
According to International Patent Classification (IPC) or to both national classification and IPC							
	DS SEAR CHED						
	numentation searched (classification system followed by 19/13,77,138	y classification symbols)					
Documentatio	n searched other than minimum documentation to the e	extent that such documents are included in	n the fields searched				
Electronic dat	ta base cornsulted during the international search (name	of data base and, where practicable, sear	ch terms used)				
C. DOCT	UMENTS CONSIDERED TO BE RELEVANT						
Category *	Citation of document, with indication, where ap	propriate, of the relevant passages	Relevant to claim No.				
X .	US 5,532,705 A (Hama) 02 July 1996 (02.07.1996); through col. 7, line 21.	; Figs. 1A, 1B, 2 and 3; col. 6, line 27	1-5 and 21				
Y	US 6,239,778 B1 (Palffy-Muhoray et al.) 29 May 20 col. 2, lines 23-37 and line 55 through col. 3, line 30 31-57).	01 (29.05.2001); Figs. 1A, 1B and 2; col. 4, lines 15-52; and col. 5, lines	6-13 and 24				
Y	US 5,148,297 A (Ishii et al.) 15 September 1992 (15 lines 54-65; col. 5, lines 46-59; and col. 6, lines 10-	.09.1992); Figs. 4, 7 and 8; col. 4, 13.	6, 7, 9 and 12-20				
Y	US 6,001,486 A (Varaprasad et al.) 14 December 19 and col. 9, lines 46-48.	999 (14.12.1999); col. 2, lines 13-19	15, 17 and 23				
Y	US 6,466,298 B1 (Fix et al.) 15 October 2002 (15.16	0.2002), col. 11, lines 1-24.	15-17, 22 and 23				
Further	documents are listed in the continuation of Box C.	See patent family annex.					
"A" documen	Special categories of cited documents:  "T" later document published after the international filing date or priorit date and not in conflict with the application but cited to understand principle or theory underlying the invention						
of particular relevance  -E" carlier application or patent published on or after the international filing date		"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone					
considered to		"Y" document of particular relevance; the considered to involve an inventive ste combined with one or more other suc	p when the document is				
"O" documen	t referring to an oral disclosure, use, exhibition or other means	being obvious to a person skilled in the	he art				
"P" document published prior to the international filing date but later than the priority date claimed		"&" document member of the same patent					
Date of the actual completion of the international search		Date of mailing of the international sear	rch report				
	004 (26,08,2004)	1 1 2 1 65 1	111				
Mail Stop PCT, Attn: ISA/US  Thei V Dueng 344 1-1 1/2/12			1.1/2/ 1				
			100 (1				
Ale	Alexandria, Vi cginia 22313-1450						
	i. (703) 30 5-3230 A/210 (second-sheet) (July 1993)	<u> </u>					

	7/ 1/	/USC	$\sim 1$	

## INTERNATIONAL SEARCH REPORT

tegory *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	
х	US 5,943,104 (Moddel et al.) 24 August 1999 (24.08.1999); Figs. 1, 3A, 3B and 6; col. 1, lines 49-64; col. 5, lines 36-52; col. 8, line 63 through col. 9, line 18.	1,2,6-9,12,13 and 18 20	
Y	US 4,106,217 (Witt) 15 August 1978 (15.08.1978), Fig. 3 and col. 5, lines 4-14.	<u>i</u> 4	
-		1	
	·		
	·		